

# Operating instructions



**Process measuring instruments**

**Model:**

**ME15-ME25-DE15-DE25-TE25**



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## 1.0 Installation and setting into operation

### 1.1 Mounting

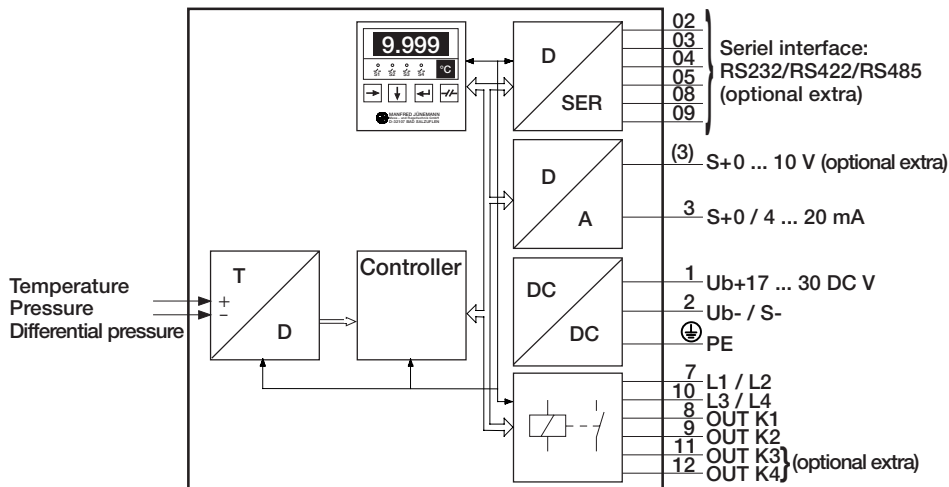
The pressure tapping points should be prepared in accordance with the indications given for the sockets. For more details, see e.g. regulation VDE/VDI 3511 and 3512, sheet 3, also DIN 837-1/2. Suitable for sealing are sealing washers to DIN 16258. The correct tightening torque is depending on material and shape of the used seal. It should not exceed 80 Nm. The mounting position should not be subject to strong vibrations und radiation heat. The mounting position, which the measuring instrument is adjusted for, is indicated on the rating plate. If the device is installed in a different position, the zero point may be offset. In this case, the zero point is readjusted as described in the menu point 10 on page 12. In the case of the differential pressure gauges model DE15 and DE25, the higher pressure is connected to the + marked connection and the lower pressure to the - marked connection.

### 1.2 Wiring

Electrical wiring is made by means of a plug. The wiring schemes can be seen in the drawings. In addition, wiring details and required power supply are given on the page 15. For the connection and application of the measuring instruments, the VDE regulations on working with high voltage as well as the rules and regulations of the professional associations concerning working with electrical devices and installations have to be observed.

### 1.3 Electrical data

Power supply	: $U_b = 17 \dots 30 \text{ V DC}$
Analogue output signal	: $0/4 \dots 20 \text{ mA}$ / 3-wire / load $\leq 400 \text{ Ohm}$ : $0 \dots 10 \text{ V}$ / 3-wire / load $\geq 10 \text{ kOhm}$ (optional extra)
Alarm contacts	: $2 \times 24 \text{ V} / 50 \text{ VA}$ / $50 \text{ W} / 2 \text{ A}$ , (4x optional extra)
Serial interface	: RS 232 / RS422 / RS485 (optional extra)



# 1.4 Abbrevitalisations

Ub+ / Ub-	: power supply
A+ /A-	: analog output signal
L1 / L2, K1, K2	: limit signals 1 and 2
L3 / L4, K3, K4	: limit signals 3 and 4
RxD, TxD, SGND	: serial interface RS232
A, B, SGND	: serial interface RS422 / RS485 halb-duplex
-RxD, +RxD, -TxD,	
+TxD, SGND	: serial interface RS422 / RS485 full-duplex
PE	: earth of thread connection / flange connection

Analog input signal:

mA+ / mA-	: [ I ] current
V+ / V-	: [ U ] voltage
TC+ / TC-	: [ T ] Thermocouples
Pt100+ / Pt100- / Pt100	: Pt100, 3-wire





Round-Connector	
PIN	Signal
1 / L	Ub+
2 / T	Ub- / S-
3 / J	S+
4 / S	TC+ / V+ / mA+ / Pt100+
5 / G	TC- / V- / mA- / Pt100
6 / R	Pt100-
7 / P	L1 / L2
8 / E	K1
9 / O	K2
10 / C	L3 / L4
11 / N	K3
12 / A	K4
13 / U	
14 / M	PE

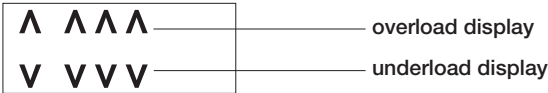
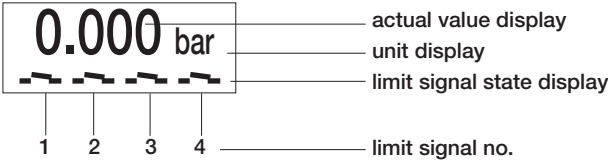
D-Sub-Connector			
PIN	RS232	RS422 / RS485 Half-Duplex	RS422 / RS485 Full-Duplex
01			
02	TxD		
03	RxD	A	+TxD
04			+RxD
05	SGND	SGND	SGND
06			
07			
08		B	-TxD
09			-RxD

# 1.5 Setting into operation

The measuring instrument is immediately ready for service after its installation into the measuring point and after the electrical connections have been made.

At the first commissioning, the display, in a pressureless state, indicates on the last digit 0, 0.0, 0.00 or 0.000,+/-1.





The four limit signals are open (     ). The limit signal numbering 1 - 4 is defined from the left to the right.



## 2.0 Parameter display and input

Display or input of a parameter are made via the four keys below the display. When the device is switched on, actual value and switching states of the limit signal are displayed (— = open, — = closed).

By pressing the correspondent button one of the following menus can be started:





Key	Function in the actual value display
	start menu help
	start display menu limit signals
	start input menu
	-

The key functions overview is called up via help menu.





The display menu indicates in succession the lower and upper switching points of the limit signal.


The parameters are set via input menu.

In the display and input menu, the lower quarter of the display shows the menu text. Via the keys, the desired parameter is selected as follows:

Key	Function in the actual value display
	to the previous menu point
	to the next menu point
	submenu / start parameter input
	end submenu















The selected parameter is displayed in the upper part of the display. the digit/sign, which can be changed, is presented in inverse order (cursor). When entering the parameters, the key function is as follows:

Key	Function in the actual value display
	change cursor position
	change parameter at cursor position
	take over parameter / end input
	reject parameter / end input





Parameter display or input will be ended by activating key  once or repeatedly, or automatically 20s after the last activation of one of the four keys.

### Example:

The maximum limit value of limit switch 2 is to be changed

Key	Value	Menu text	Menu
	XX.XX bar	(limit switch display)	actual value display
2x 		display min./max.	1
		adjust limit switch	3
	0000 PIN	adjust limit switch	input
	XX.XX PIN	adjust limit switch	input
		adjust 1. limit switch	3.1
		adjust 2. limit switch	3.2
		limit switch enable	3.2.1
3x 		high limit	3.2.4
	XX.XX bar	high limit	input
	XX.XX bar	high limit	input
		high limit	3.2.4
		adjust 2. limit switch	3.2
		adjust limit switch	3
	XX.XX bar	(limit switch display)	actual value display

## Structure of input menu and parameter range

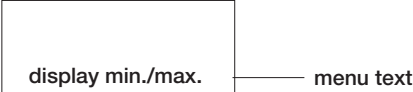
Menü	Parameter
<b>1</b>	<b>display min./max. value</b>
1.1	display min. value
1.2	display max. value
<b>2</b>	<b>delete min./max. value</b>
<b>3</b>	<b>adjust limit switch</b>
3.1	adjust 1. limit switch
3.2	adjust 2. limit switch
3.3	adjust 3. limit switch
3.4	adjust 4. limit switch
3.x.1	limit switch enable
	 contact always open
	 contact is switching
3.x.2	contact function
	 maximum break contact
	 maximum make contact
3.x.3	low limit
	-9999 .... 9999
3.x.4	high limit
	-9999 .... 9999
3.x.5	low limit delay
	00.0...19.9 s
3.x.6	high limit delay
	00.0...19.9 s
<b>4</b>	<b>integration time</b>
	00.0...19.9 s
<b>5</b>	<b>Datenlogger</b>
5.1	intervall
	1s...24h
5.2	year
	2000...2099
5.3	date
	01.01. ...31.12.
5.4	time
	00:00...23:59
<b>6</b>	<b>display unit</b>
6.1	choose unit
	mbar, bar, Pa, hPa, kPa, at, kg/cm <sup>2</sup> , kp/cm <sup>2</sup> , mmH <sub>2</sub> O, mH <sub>2</sub> O, mmWs, atm, mWs, Torr, mmHg, mmQs, psi, lb/in <sup>2</sup> , inH <sub>2</sub> O, ftH <sub>2</sub> O, inHg, K, °C, °R, °F, % or customized unit
6.2	input unit (customized unit)
6.2.1	input text
	2 x 5 signs
6.2.2	decimal point position
	9.999 ... 9999
6.2.3	input zero
	-9999 .... 9999
6.2.4	input finish
	-9999 .... 9999
<b>7</b>	<b>adjust output</b>
7.1	measuring range zero
	-9999 .... 9999
7.2	range end point
	-9999 .... 9999




<b>8</b>	<b>serial interface</b>
8.1	baudrate
	1200, 2400, 4800, 9600, 19200, 38400 oder 76800
8.2	databits
	7 or 8
8.3	parity
	- (no parity), 0, EVEN, ODD
8.4	stopbits
	1 or 2
<b>9</b>	<b>change language</b>
	German, English or French
<b>10</b>	<b>calibration sensor</b>
10.1	decimal point position
	9.999 ... 9999
10.2	input zero
	-9999 .... 9999
10.3	input finish
	-9999 .... 9999
10.4	calibrate zero
10.5	calibrate finish
<b>11</b>	<b>calibration output</b>
11.1	input unit
	V or mA
11.2	input zero
	00.00 ... 99.99
11.3	input finish
	00.00 ... 99.99
11.4	input minimum
	00.00 ... 99.99
11.5	input maximum
	00.00 ... 99.99
11.6	calibrate zero
	0000 ... 9999
11.7	calibrate finish
	0000 ... 9999
<b>12</b>	<b>change PIN</b>
12.1	delete min./max.
	0000 ... 9999
12.2	adjust limit switch
	0000 ... 9999
12.3	integration time
	0000 ... 9999
12.4	display unit
	0000 ... 9999
12.5	adjust output
	0000 ... 9999
12.6	serial interface
	0000 ... 9999
12.7	change language
	0000 ... 9999
12.8	calibrate sensor
	0001 ... 9999
12.9	calibrate output
	0001 ... 9999






3.0 Input menu

The input menu is being started by pressing key . Instead of the limit signal state, the display is showing the menu text. The upper part of the display is empty.



The starting point for the selection of a parameter in the description hereunder is the actual value display. Some of the measuring instrument functions are optional. The indications concerning multiple activations of a key (e.g. 5x ) refer to instruments with all options. Menus 2 to 10 are protected through a four-digit PIN each (see menu 11 „enter PIN“). After selection of the menu, the PIN is to be confirmed. The upper part of the display shows value „0000“ followed by „PIN“. The digit that can be changed by activating key , is marked by the cursor (inverse display). The cursor position is shifted to the left by 1 digit via key .








Enter PIN by pressing buttons  and  and acknowledge by pressing button . (In the event the existing PIN = „0000“, this inquiry is not applicable).

A parameter is displayed and input in the same way as the PIN.

3.1 Menu 1

**Display min./max. value** (maximum pointer function)









The instrument features a maximum pointer function. The minimum and maximum value are displayed.

Key	Value	Menu text
		display min./max.
	XX.XX bar	minimum
	XX.XX bar	maximum
		display min./max.
	(actual value disp.)	(limit signal display)

3.2 Menu 2

**Delete min./max. value** (maximum pointer function)

Instrument features a maximum pointer function. The minimum and maximum values are set onto the actual value.

Key	Value	Menu text
		display min./max.
		display min./max.
	0000 PIN	delete min./max. <sup>1)</sup>
enter the PIN via  and 		<sup>1)</sup>
		min./max. erased
		delete min./max.
	(actual value disp.)	(limit switch display)

<sup>1)</sup> If the PIN for this menu = „0000“, no request is made (to change the PIN look 3.11).

### 3.3 Menu 3

#### Adjust limit switch

The measuring instrument features 4 limit switches. For each limit switch, the following parameters can be defined:

Parameter	Set-up on delivery
1. Release:  contact breaks,  contact makes	always open
2. Contact function:  make,  break	make
3. Lower switching point	0
4. Upper switching point	0
5. Deceleration time of the lower switching point	0.0 s
6. Deceleration time of the upper switching point	0.0 s

Key	Value	Menu text
2 x		display min./max.
	0000 PIN	adjust limit switch
via  and  enter PIN		adjust limit switch <sup>1)</sup>
		adjust 1. limit switch
via  select limit signal		
		limit switch enable
		limit switch enable
via  turn release on or off		
		limit switch enable
		contact function
		contact function
via  select make or break contact		
		contact function
		low limit
	00.00 bar	low limit
via  and  enter switching point		
		low limit
		high limit
	00.00 bar	high limit
via  and  enter switching point		
		high limit
		low limit delay
	00.0 s	low limit delay
via  and  enter time		
		low limit delay
		high limit delay
	00.0 s	high limit delay
via  and  enter time		
		high limit delay
3 x   (actual value disp.)		(limit switch display)










<sup>1)</sup> If the PIN for this menu = „0000“, no request is made (to change the PIN look 3.11).



### 3.4 Menü 4

#### Integration time (damping)

The measuring instrument features a damping function. The mean value will be obtained via integration time, displayed as actual value and interpreted for the output signal. Setting on delivery 0.0 (damping off).

Key	Value	Menu text
3 x 		display min./max. integration time
 0000	PIN	integration time <sup>1)</sup>
via  and  enter PIN		<sup>1)</sup>
 00.0	s	integration time
via  and  enter time		
		integration time
 (actual value disp.)		(limit signal display)

<sup>1)</sup> If the PIN for this menu = „0000“, no request is made (to change the PIN look 3.11).






























### 3.5 Menü 5

#### Data logger (optional)

By means of the data logger function, the measuring value will be stored in an adjustable time intervall. The stored measuring values can be read-out via PC. Date, hour, mean value, minimum and maximum values of the measuring value evaluated during the time intervall, are displayed for each time intervall. Date and hour are set on the actual time at the time of delivery.

**Attention:** After missing power supply you have to adjust the real time clock again.

#### 3.5.1 Data logger

Key	Value	Menu text
4 x 		display min./max. data logger / clock
 0000	PIN	data logger / clock <sup>1)</sup>
via  and  enter PIN		<sup>1)</sup>
		interval
 XXX	s	choose interval unit
via  set up measuring interval unit		s / min or h
		interval
		interval set up
 XX:XX	X	time
via  and  set up measuring interval		0 = event control
		interval set up
		time
 XX:XX.		time
via  and  set up time		
		time
		date
 XX.XX		date
via  and  set up date		
		date
		year
 20XX		year
via  and  set up the running year		
		
2 x  (actual value disp.)		(limit signal display)












<sup>1)</sup> If the PIN for this menu = „0000“, no request is made

## 3.6 Menu 6

### Display unit

For displaying the measuring value, units such as SI, ANSI, BS and technical units are on hand, as well as a unit to be defined by the user (see 3.5.2).

#### 3.6.1 Select unit





























Key	Value	Menu text
4 x   	0000 PIN	display min./max. display unit display unit <sup>1)</sup>
via  and 		enter the PIN <sup>1)</sup>
 	XX.XX  / °C	choose unit choose unit
via 		select the unit
2 x  	(actual value disp.)	choose unit (limit switch display)

<sup>1)</sup> If the PIN for this menu = „0000“, no request is made (to change the PIN look 3.11)

#### 3.6.2 Keying in customized unit

The measured value can be converted into other dimensions.

For the conversion, the unit with 2 x 5 signs maximum has to be entered, as well as those values that correspond to the zero point and the end point of the measuring range (see menu 9). Setting on delivery is 0.0 to 100.0 %.

Key	Value	Menu text
5 x   	0000 PIN	display min./max. display unit display unit <sup>1)</sup>
via  and 		enter the PIN <sup>1)</sup>
   	%	choose unit input unit input text input text
via  and 		enter text of unit
  	9999.9 xxxxx	input text decimal point position decimal point position
via 		enter position of decimal point
  	000.0 xxxxx	decimal point position input zero input zero
via  and 		enter zero point
  	100.0 xxxxx	input zero input finish input finish
via  and 		enter end point
3 x   	(actual value disp.)	input finish (limit signal display)

<sup>1)</sup> If the PIN for this menu = „0000“, no request is made (to change the PIN look 3.11).



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








### 3.7 Menu 7

#### Setting of the analog output (optional)

By means of this menu, the relation between the analog output and the measuring range is defined. For that, one measuring point each is assigned to the zero point and end point of the analog output (see menu 10). Setting on delivery:

Zero point of analog output corresponds to zero point of measuring range.

End point of analog output corresponds to end point of measuring range.





















Key	Value	Menu text
6 x 		display min./max.
 0000 PIN		adjust output
		adjust output <sup>1)</sup>
via  and  enter the PIN		<sup>1)</sup>
		measuring range zero
 00.00 bar		measuring range zero
via  and  enter value		
		measuring range zero
		measuring range finish
 00.00 bar		measuring range finish
via  and  enter value		
		measuring range finish
2 x  (actual value disp.)		(limit switch display)

<sup>1)</sup> If the PIN for this menu = „0000“, no request is made (to change the PIN look 3.11)

### 3.8 Menue 8

#### Serial interface (optional)

This menu defines the data transmission format of the serial interface. Set-up on delivery: 1200 Baud, 8 data bits, no parity, and 1 stop bit. The display value is sending as ASCII characters two times per second.










Key	Value	Menu text
7 x 		display min./max.
 0000 PIN		serial interface
		serial interface <sup>1)</sup>
via  and  enter the PIN		<sup>1)</sup>
	1200	baudrate
		baudrate
via  select baudrate		
		baudrate
		databits
 8		databits
via  select 7 or 8 data bits		
		databits
		parity
 		parity
via  select parity		
		parity
		stopbits
 1		stopbits
via  select 1 or 2 stopbits		
		stopbits
2 x  (actual value disp.)		(limit switch display)

<sup>1)</sup> If the PIN for this menu = „0000“, no request is made (to change the PIN look 3.11)

### 3.9 Menu 9

#### Changing the language

The menu text can optionally be displayed in German, English or French. Display set-up on delivery in German language.





























Key	Value	Menu text
8 x   	0000 PIN	display min./max. change language change language <sup>1)</sup>
via  and 	enter the PIN	<sup>1)</sup>
		deutsch
via 	select the language: German, English, French	
 	(actual value disp.)	change language (limit switch display)

<sup>1)</sup> If the PIN for this menu = „0000“, no request is made (to change the PIN look 3.11).

### 3.10 Menu 10

#### Calibrating the sensor

By means of this menu, the measuring range of the sensor will be keyed in, and the output signal of the sensor at the zero and end point of the range will be measured and setup. The settings will be made at the factory by using appropriate pressure standards. Inexpert inputs into this menu cause malfunctions of the measuring instrument.

Key	Value	Menu text
9 x   	0000 PIN	display min./max. calibrate sensor calibrate sensor <sup>2)</sup>
via  and 	enter the PIN	<sup>2)</sup>
 	99.99 bar	decimal point position decimal point position
via 	enter the decimal point position	
  	00.00 bar	decimal point position input zero input zero
via  and 	enter zero point of sensor	
  	10.00 bar	input zero input finish input finish
via  and 	enter end point of sensor	
  	0.00 bar	input finish calibrate zero calibrate zero
Connect the measuring instrument to a sufficiently precise pressure standard. At the measuring point, generate the value shown in the display of the instrument and store via  in the measuring instrument.		
  	10.00 bar	calibrate zero calibrate finish calibrate finish
Connect the measuring instrument to a sufficiently precise pressure standard. At the measuring point, generate the value shown in the instrument display and store via  in the measuring instrument.		
2 x  	(actual value disp.)	calibrate finish (limit switch display)

<sup>2)</sup> To change the PIN look 3.11






































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### 3.11 Menu 11

#### Calibrating the analog output (optional)

Via this menu, zero point, end point, minimum and maximum value of the analog output are being input, and the output signal will be set on zero and end point input. The settings will be made at the factory by using appropriate pressure standards.

Key	Value	Menu text
10x 		display min./max.
	0000 PIN	calibrate output
via  and 		calibrate output <sup>1)</sup>
		input unit
		input unit
via  select V or mA		
		input unit
		input zero
	04.00 mA	input zero
via  and 		enter output zero point (see rating plate)
		input zero
		input finish
	20.00 mA	input finish
via  and 		enter output end point (see rating plate)
		input finish
		input minimum
	02.00 mA	input minimum
via  and 		enter minimal output value
		input minimum
		input maximum
	22.00 mA	input maximum
via  and 		enter maximum output value
		input maximum
		calibrate zero
	0000	calibrate zero
Connect the analog output to a sufficiently precise pressure standard. Key in the figure in such a way that the pressure standard shows the value indicated for the zero point.		
		calibrate zero
		calibrate finish
	0000	calibrate finish
Connect the analog output to a sufficiently precise pressure standard. Key in the figure in such a way that the pressure standard shows the value indicated for the end point.		
		calibrate finish
2 x  (actual value disp.)		(limit signal display)

<sup>1)</sup> To change the PIN look 3.11

### 3.12 Menue 12

#### Keying in the PIN









Menues 2 to 10 are protected by means of a 4-digit PIN each.  
On delivery the values will be set as follows:



Menue	PIN	Menuetext
2	0000	delete min./max. <sup>1)</sup>
3	0000	adjust limit switch <sup>1)</sup>
4	0000	integration time <sup>1)</sup>
5	0000	display unit <sup>1)</sup>
6	0000	adjust output <sup>1)</sup>
7	0000	serial interface <sup>1)</sup>
8	0000	change language <sup>1)</sup>
9	1000	calibrate sensor <sup>2)</sup>
10	1000	calibrate output <sup>2)</sup>

<sup>1)</sup> If the PIN for this menue = „0000“, no request is made




<sup>2)</sup> PIN must not be = „0000“ to be able to change these parameters

Each PIN can be set individually via menue „enter PIN“. The menue call-up is made by the following key combination:

Key	Value	Menue text
 11x  	PIN	display min./max. change PIN delete min./max.
 change PIN  to the next PIN  to the previous PIN  break-off PIN input After breaking off or input of the last PIN, the display shows:		
	(actual value disp.)	change PIN (limit switch display)




After selecting the menue, the existing PIN has to be confirmed. In the upper part of the display the value „0000“ is indicated followed by „PIN“. The place that can be changed via key  is marked by the cursor (inverse display). Via key , the cursor position is shifted to the left by one digit.



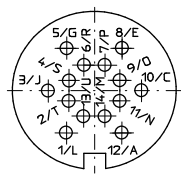
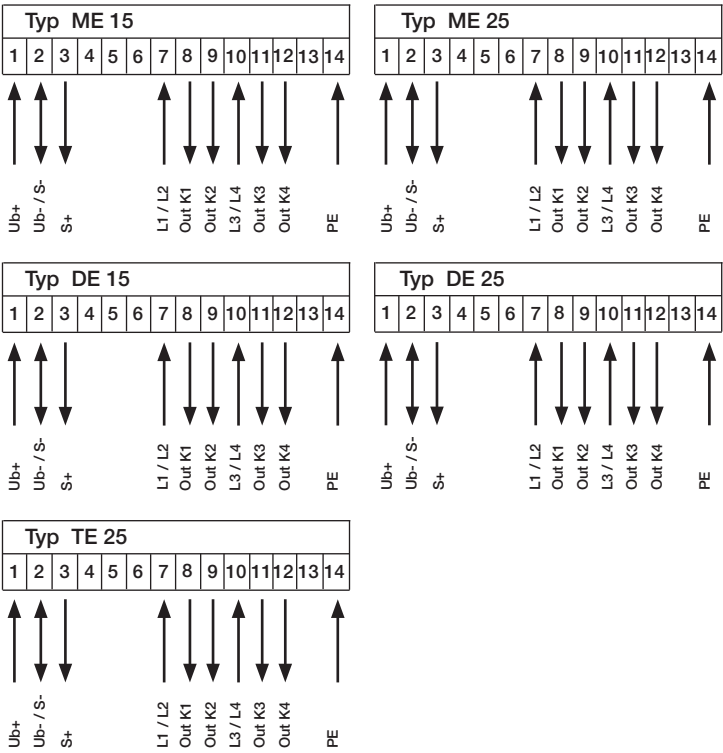
Key in the existing PIN by keys  and  and confirm via key . (In the event that the existing PIN = „0000“, this inquiry is not applicable).

In the upper part of the display, the value „0000“ is shown followed by „new PIN“.



Key in the desired new PIN by pressing the keys  and  and confirm by key .

4.0 Wiring details



Plug in connector Art.-N°.: 408 837

